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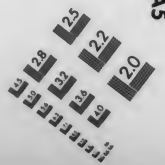
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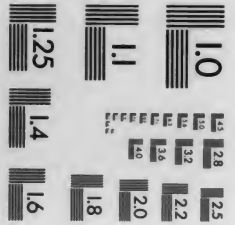


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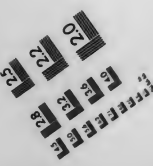
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**THE JAPANESE FISHING INDUSTRY,
1928-39 AND PROSPECTS FOR 1953**

OIR Report No. 4627

March 30, 1948

An analysis of Japan's production, consumption, and trade of fish in the period 1928-39 (with special emphasis on the period 1930-34) and a projection of the position of the Japanese fishing industry in a normal postwar year labeled 1953 for convenience.

DEPARTMENT OF STATE
Division of Research for Far East
OFFICE OF INTELLIGENCE RESEARCH

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TABLE OF CONTENTS

	Page
Summary	iv
I. Importance of the Japanese Fishing Industry	1
A. Japan's Contribution to the World Fish Catch	1
B. The Importance of Fish in the Japanese Diet	2
C. The Place of Fish in Japanese Trade	2
II. Production, 1928-39	2
A. Coastal Fishing	3
B. Aquiculture	4
C. Offshore Fishing	4
D. Overseas Fishing	5
III. The Relative Importance of Various Species of Fish, 1928-39 ..	6
A. Herring and Sardines	6
B. Other Fish	7
1. Tuna	9
2. Salmon and Trout	9
3. Crab	10
IV. Whaling, 1928-39	10
A. Coastal and Colonial Whaling	10
B. Antarctic Whaling	11
C. Whaling in Northern Waters and the Arctic Ocean	11
D. Whale Oil	11
V. Trade, 1928-39	12
A. Imports	13
B. Exports	13
VI. Balance of the Total Supply and Per Capita Consumption of Fish, 1928-36	15
VII. Prospects of the Japanese Fishing Industry in a Normal Postwar Year (1953)	16

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LIST OF TABLES

	<u>Page</u>
1. Japan's Contribution to the World Fish Catch, 1935 and 1936	21
2. The Fish Catch of the Japanese Empire: Annual Averages for the Periods 1928-30, 1930-34, 1935-36, and 1937-39	22
3. Japan Proper: Fish Catch by Areas, Annual Averages for 1928-30, 1930-34, and 1935-36	23
4. Japan Proper: Production of Herring and Sardines Compared with Total Fish Catch, 1928-39	24
5. Japan Proper: Production of Herring and Sardines from Coastal and Offshore Fisheries, 1928-39	25
6. Japan Proper: Production of Tuna from Coastal and Offshore Fisheries, 1928-39	26
7. Japan Proper: Production of Salmon and Trout from Coastal and Overseas Fisheries, 1928-39	27
8. Japan Proper: Production of Crab from Coastal and Overseas Fisheries, 1928-39	28
9. Japan Proper: Imports and Exports of Fish, 1928-36	29
10. Japan Proper: Exports of Canned Crab, Salmon, and Trout, 1928-40	30
11. Japan Proper: Exports of Canned Tuna and Sardines, 1934-40	31
12. Japanese Whale Catch, Annual Averages 1928-30, 1930-34, 1935-36, and 1937-39	32
13. Japan Proper: Balance of the Total Supply and Per Capita Gross Consumption of Fish, 1928-36	33
14. Japan's Daily Prewar Per Capita Consumption of Animal Protein ..	34
15. Comparison of Japan's Daily Prewar Per Capita Consumption of Animal Protein with Present Consumption	35

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LIST OF TABLES (cont'd)

APPENDIX: STATISTICS ON POPULATION AND FOREIGN EXCHANGE

	<u>Page</u>
Table A Estimated Population of Japan Proper, 1928-40 and 1953	37
Table B Yen-Dollar Exchange Rates, 1928-40	38

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SUMMARY

The main problem of Japan's fishing industry is to increase production in order to (1) meet domestic requirements of animal protein and of fats and oils and (2) contribute to the restoration of Japan's balance of payments by greatly increasing exports of canned fish.

① Fish plays as important a role in the Japanese diet as do meat and dairy products in Western countries. Before the war the per capita food consumption of fish in Japan amounted to over 20 kilograms per year and constituted over 80 percent of the total animal protein intake. Present consumption of fish amounts to only about 13 kilograms per capita per year. The adverse effect of the loss of fishing grounds will be felt even more in future years. Before the war, about 20 percent of the total fish catch of Japan proper was caught outside the present fishing areas. It is estimated that by 1953, with an increase in population of almost 25 percent over the 1930-34 level, per capita consumption of fish will have declined to about 50 percent of the 1930-34 level.

② Industrially fish is important for fertilizer and for fats and oils. In 1930-34 annual per capita consumption of fish for these uses amounted to almost 30 kilograms. Whales are particularly important for oil. In 1936 whales caught in Antarctic waters yielded 26,000 metric tons of oil, which represented 7 percent of Japan's total production of fats and oils. In addition to this, coastal and colonial whaling yielded about 4,600 metric tons of oils.

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③ In order to provide the Japanese population with an average annual gross consumption (including industrial uses) of about 50 kilograms of fish per capita (the 1930-34 level), a total supply of about 4.2 million metric tons would be required. With present restrictions, however, it is estimated that the average annual catch (excluding seaweed — which is usually included in Japanese statistics on fish production — and whales) cannot be raised above 2.7 million metric tons, with a range of from 2.4 to 3.0 million metric tons. During the 1930's the average annual catch of Japan proper (excluding seaweed and whales) amounted to 3.4 million metric tons, while the annual catches of the colonies averaged some 1.8 million metric tons.

Increase of the fish catch is also vital to reinstate Japan as a fish exporter. During 1930-34 Japan was a net importer of fish in terms of quantities but a substantial net exporter of fish in terms of value during the entire period 1928-39. Exports — in fresh fish equivalents — amounted to approximately 10 percent of the total catch and consisted largely of products of high value per ton, such as crab, salmon, and tuna, while imports were composed of medium- and low-grade fish (largely dried and salted) for home consumption.

④ If the Japanese should not operate their fisheries north of Japan and in the Okhotsk and Bering Seas, they would be unable to produce canned salmon and crab for export. These species played a major role, by value, in the total Japanese exports of fish. In 1939, about 65 percent of the value of total fish exports was contributed by fisheries that operated almost entirely north of Japan proper. Furthermore, if there were to be no fishing or a reduction of fishing

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in Korean waters and southern waters, the Japanese catch of sardines and tuna respectively might be reduced somewhat.

There appear to be three possible ways in which Japan may attempt to solve its problems of production, trade, and consumption of fish: (1) expansion of fishing areas, (2) development of new markets for fish products, and (3) reduction of the amount of fish used for non-food purposes. To meet requirements of over 4 million metric tons, means will have to be found to increase the average annual catch by about 1.5 million metric tons. To find markets for Japan's fish products, it appears important that currency arrangements be made that will permit other countries to purchase freely. Reduction of the amount of fish used for non-food uses (such as fish meal for fertilizer and animal feed) would contribute to meet increased requirements caused by the increase in population. It is estimated that about 600,000 metric tons might thus be saved for food. There would, however, still be a deficit of about 1 million metric tons of fish.

It appears, therefore, that a solution of the problems of raising the low level of animal protein consumption and providing additional means of obtaining foreign exchange depends chiefly on the possibility of raising the fish catch through expansion of coastal and offshore fishing.

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THE JAPANESE FISHING INDUSTRY,
1928-39 AND PROSPECTS FOR 1953

I. IMPORTANCE OF THE JAPANESE FISHING INDUSTRY

A. Japan's Contribution to the World Fish Catch

The Japanese average annual fish catch normally exceeds by far that of any other country in the world. The annual catch of fish and shellfish of Japan proper¹ amounted to 3,554,000 metric tons in 1935 and 3,872,000 metric tons in 1936. This was almost twice the production of fish in the United States, which ranked second with its catches of 1,883,000 metric tons in 1935 and 2,196,000 metric tons in 1936. Competing with the United States for second place was the USSR, whose fisheries caught 1,550,000 metric tons in 1935, 1,620,000 metric tons in 1936, and in 1937 exceeded somewhat United States production. Next ranked China, Norway, and Great Britain, each of which had an annual average of over 1,000,000 metric tons for the two years 1935 and 1936. (See Table 1.) Germany and Canada followed, with annual average catches of about 520,000 and 470,000 metric tons respectively for these two years. France and Iceland each averaged somewhat over 260,000 metric tons annually, or less than 10 percent of the Japanese catch, during this period.

If the average annual catches of Karafuto (330,000 metric tons) and Korea (about 1,470,000 metric tons) are added to the total production of fish in Japan proper, the Japanese Empire in 1935 and 1936 shows an average annual catch of about 5,500,000 metric tons (Table 1), or one-

1. Excluding fish landed in ports of Karafuto, Korea, and Formosa.

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third of the estimated total world production of fish.¹

B. The Importance of Fish in the Japanese Diet

In Japan, fish and fish products play as important a role in the diet as do meat and dairy products in Western countries. The Japanese depend on fish for most of their animal protein consumption; meat, eggs, milk, and dairy products supply only about 15 percent of the total animal protein intake. Whales play only a small role in providing animal protein; they are, however, important as a major source of oil.

C. The Place of Fish in Japanese Trade

Although Japan's exports and imports of fish were quite similar in quantity during the period 1928-39, Japan was a substantial net exporter of fish in terms of value throughout the period. In 1930, exports of fish were valued at almost 45 million yen and accounted for about 2.5 percent of the total value of Japanese exports. By 1936 the physical quantity of fish exports had increased by about 45 percent and the value by about 75 percent (amounting to 78 million yen), but the share of fishery products in the total value of exports had declined somewhat, to 2.2 percent.²

II. PRODUCTION, 1928-39

The average fish catch in Japan proper during the period 1930-34 amounted to 3.27 million metric tons per year. This compares with an

1. World production of fish in the late 1930's is estimated at about 16.8 million metric tons.
2. Exports of all commodities from Japan proper to all areas amounted to about 1.8 billion yen in 1930 and 3.5 billion yen in 1936. (OIR-2815, Vol. II, January 1946, p.32, UNCLASSIFIED)

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annual average catch of 2.62 million metric tons in the three-year period 1928-30, 3.71 million metric tons in 1935-36, and 3.37 million metric tons in 1937-39. (See Table 2.) These figures do not include whales and seaweed. The Japanese generally include production of seaweed in their data on total fish production, a fact that has been the source of frequent confusion and overestimation of fish production, particularly with regard to estimates of present and future production.¹

The figures given in this report for total Japanese production of fish and shellfish include the aquicultural, coastal, offshore, and over-seas catch. The relative importance of the various fishing areas is shown in Tables 2 and 3.²

A. Coastal Fishing

Coastal fishing, which includes fishing in coastal and inland waters (excluding aquiculture) supplied about 70 percent of the total catch during the period 1928-39. Production increased from somewhat over 1.7 million metric tons in 1928 to about 3.2 million metric tons in 1933 and then declined gradually to about 2 million metric tons in 1939. During 1930-34 the coastal catch averaged 2.3 million metric tons annually and constituted 72 percent of the total fish catch landed in Japan proper. (See Tables 2 and 3.)

1. In Japan proper, average annual production of seaweed in 1930-34 amounted to about 550,000 metric tons.
2. For principal types of fish and shellfish caught in these areas, see footnotes to Table 3.

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B. Aquiculture

Aquiculture production, which averaged 63,000 metric tons annually during the period 1928-30, increased to an annual average of 75,000 metric tons in the period 1930-34 and 123,000 metric tons in 1935-36. The culture of oyster, clam, mullet, carp, and eel has been steadily developed and was particularly encouraged by the government during World War II; it reached its peak in 1943, with a production of over 200,000 metric tons. By 1946, however, feed for fish raised in rice fields and ponds became so scarce that production decreased considerably, amounting to only about 100,000 metric tons.

C. Offshore Fishing

"Offshore fishing"¹ differs from "coastal fishing" mainly in the kinds of boats used. Coastal fishing is carried on by small boats or from the shore, while offshore fishing is carried on by powered boats. Offshore fishing may take place as near to the shore as coastal fishing. Therefore, there is not much difference in the species of fish caught in coastal waters and offshore waters. Offshore fishing from Hokkaido, however, may be in Kurile waters and not much different from "overseas" fishing. (See Section II, D, below.)

The offshore catch increased from an annual average of 538,000 metric tons during 1928-30 to 643,000 metric tons in 1930-34 and 895,000 metric tons in 1935-36, and then declined slightly to an annual average

1. Also called "home waters fishing."

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of 812,000 metric tons in 1937-39. (See Table 2.) Production reached its peak with 975,000 metric tons in 1936, when a record catch of over 325,000 metric tons of sardines was made.

D. Overseas Fishing

Overseas fishing, which includes operations from Japanese ports that were carried on in Korean, Formosan, Kwantung, Nanyo, Kurile, and Russian waters and operations from trawlers and floating canneries, contributed about 10 percent of the total catch of Japan proper during the period 1928-39. The value of the overseas catch, however, constituted a more sizable portion of the total value of the Japanese catch, because crab and salmon were the principal species caught in overseas waters.¹ The average annual overseas catch ranged from 215,000 metric tons for the period 1930-34 to over 370,000 metric tons for 1937-39.²

The catch in Russian waters, which averaged about 80,000 metric

1. For the overseas catch, statistics on the value of fish as landed are incomplete and value figures are reported for only part of the manufactured products. There are, therefore, no figures comparable to the value figures for coastal species as landed.
2. It should be noted, however, that no data are available for operations in Kurile waters during the period 1928-34. Since the average catch in the Kuriles in the following two years amounted to over 80,000 metric tons, it may appear that the data on total overseas catch for 1928-34 should be increased by roughly the amount of the Kuriles catch. It is believed, however, that in these earlier years the Kuriles catch may be included under home waters fisheries. In order to avoid possible double-counting, no adjustment was made in the overseas figure.

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tons annually,¹ constituted till 1935 the largest part of the total overseas catch. (See Table 3.) Catches ranged from about 50,000 metric tons in 1931 to 120,000 metric tons in 1928. The Russian waters catch was closely followed by the catch in Korean waters, which averaged about 70,000 metric tons annually. Beginning in 1936, however, the catch in Korean waters began to decline; the average annual catch for 1937-39 amounted to only about 25,000 metric tons. Production from Kurile waters, on the other hand, showed a considerable increase over earlier years, with an annual average catch of almost 180,000 metric tons for 1937-39. Production from trawling averaged 40,000-60,000 metric tons a year during the period 1928-39, while floating canneries produced annually from about 16,000 metric tons in the late 1920's to over 26,000 metric tons in 1935-36. (See Table 3.) The catches in Formosan, Kwantung, and Nanyo waters were negligible, ranging from some 1,000 metric tons annually in Formosan waters to somewhat less than 3,000 metric tons in Nanyo waters and about 4,000 metric tons off the Kwantung Peninsula.

III. THE RELATIVE IMPORTANCE OF VARIOUS SPECIES OF FISH, 1928-39

A. Herring and Sardines

Over-all production of fish in Japan rises and falls with high or low catches of herring and sardines. During the period from 1928-39, the largest total fish catch was made in 1933. The record yield of nearly

1. Statistics on catch in Russian waters are reported in koku (a volume unit). The conversion factor of 0.15 for converting to metric tons — recommended in Morinsho Tokelhyo (Agricultural Statistics) — has been used. This is necessarily a very rough measure, since a conversion from a volume unit would vary with the species and since the proportions of different kinds of fish in the total catch change from year to year. Therefore, allowance should be made for a margin of error of about $\pm 15,000$ metric tons.

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4.2 million metric tons in that year was due mainly to a huge herring catch, about three times the average. The average annual herring catch during 1928-32 amounted to about 375,000 metric tons; in 1933 over 1 million metric tons were landed. In 1935, production of herring fell below 230,000 metric tons, and after 1935 it did not even reach the 150,000 mark.

The catch of sardines, however, showed a considerable increase during the period from 1931 to 1939, averaging over 1 million metric tons a year. The lowest catch, about 675,000 metric tons, was made in 1928; production reached its peak in 1936, with over 1,625,000 metric tons. The second highest catch — about 1,525,000 metric tons — was made in 1933, when over-all fish production reached its record. (See Tables 4 and 5.)

A comparison of the herring and sardines catch (coastal and off-shore fisheries) with the total fish catch for Japan proper shows that there is a high degree of correlation in the year-to-year variations of these two series. (See chart on page 8.)

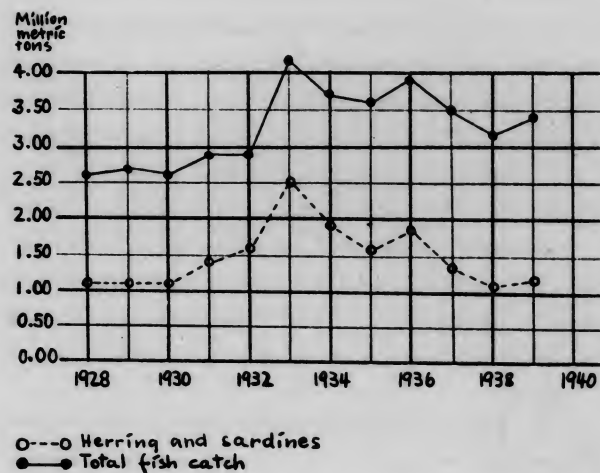
B. Other Fish

The chart on the following page shows that the catch of all other fish averaged about 1,500,000 metric tons annually during the period 1928-34 and subsequently increased to about 2,000,000 metric tons a year. Herring, bonito, mackerel, yellow-tail, cod, pollock, seabream, and flatfish were used mainly for home consumption, while salmon, trout, crab, tuna, and sardines played an important role in exports. In order to

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A COMPARISON OF THE HERRING AND SARDINE CATCH WITH THE TOTAL FISH CATCH, JAPAN PROPER, 1928-39



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forecast the future possibilities of the Japanese trade in fisheries products, the species that are important in trade are considered separately.

1. Tuna. Japanese tuna fishing was carried on mainly off the east coast of Japan proper and near the Ryukyu and Bonin Islands. Production of tuna increased steadily from 44,000 metric tons in 1928 to 86,000 metric tons in 1939. (See Table 6.) The annual average catch during 1930-34 amounted to 62,000 metric tons and in 1935-39 reached 70,000 metric tons.¹ Of the four kinds of tuna, albacore was caught only in the offshore fisheries, while bluefin tuna, yellowfin tuna, and big-eyed tuna were also caught in coastal waters. Albacore was the principal export variety.

2. Salmon and Trout. Operations of the salmon and trout fisheries were confined almost entirely to the waters north of Japan proper, extending from Hokkaido to the Kurile Islands, the east coast of Siberia, and the Kamchatka Peninsula. The overseas catch generally exceeded the coastal catch by far, accounting for an average of 65 percent of the total production of salmon and trout during the years 1928-39. The coastal catch increased from 19,900 metric tons in 1928 to 176,000 metric tons in 1937; it averaged 44,000 metric tons annually in the years 1930-34 and 136,000 metric tons in the period 1935-39.

1. Japanese statistics on tuna include different species of tuna, plus marlins and swordfish.

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The overseas catch ranged from somewhat less than 50,000 metric tons in 1931 to over 330,000 metric tons in 1939, averaging about 80,000 metric tons per year during the period 1930-34 and 236,000 metric tons in 1935-39. (See Table 7.)

3. Crab. Japanese crab fishing was concentrated around Hokkaido and extended northward to the Kurile waters, the Bering Sea, and the Sea of Okhotsk. Production of crab during the period 1928-39 ranged from somewhat less than 20,000 metric tons in 1932 to almost 50,000 metric tons in 1939, averaging about 25,000 metric tons annually during the period 1930-34 and almost 40,000 metric tons in 1935-39. Until 1932, the catch from overseas waters accounted for from 55 to over 80 percent of the total crab catch. Beginning in 1933, coastal production of crab increased considerably, constituting over half of the total production. (See Table 8.)

IV. WHALING, 1928-39

Japanese whaling operations were carried on off the coasts of Japan, Korea, Karafuto, Formosa, and the Kwantung Peninsula before 1934. Beginning in late 1934, operations were extended to the Antarctic Ocean. In 1940 and 1941, the whaling industry operated also in northern waters off the Kurile Islands and Kamchatka, extending into the Bering Sea and the Arctic Ocean.

A. Coastal and Colonial Whaling

Average annual production from coastal whaling amounted to somewhat less than 50,000 metric tons in 1930-34 and increased to an average of almost 80,000 metric tons during 1937-39.¹ (See Table 12.) The

1. Based on an average weight of 40 metric tons per whale.

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coastal whale catch increased from about 40,000 metric tons in 1931 to somewhat over 85,000 metric tons in 1939. The colonial catch,¹ on the other hand, decreased from about 14,000 metric tons in 1930 to 5,800 metric tons in 1939. The annual colonial catch for 1930-34 averaged approximately 9,000 metric tons (Table 12). By far the largest part of the colonial catch was taken in Korean waters.

B. Antarctic Whaling

Antarctic whaling, which began with the 1934-35 season, developed rapidly in the following years. During the first year, the one factory ship and three chasers in operation yielded a catch of 213 whales, or about 15,000 metric tons.² Catches increased from year to year thereafter, reaching their peak in the 1940-41 season, when about 700,000 metric tons were taken. The average annual catch from 1937-39 amounted to about 470,000 metric tons (Table 12). By 1937, Japan accounted for over 12 percent of the total Antarctic whale catch.

C. Whaling in Northern Waters and the Arctic Ocean

Whaling operations in northern waters, which were carried on during 1940 and 1941, yielded an average of about 45,000 metric tons annually.

D. Whale Oil

Antarctic whales yield more than twice as much oil per weight unit as do whales caught in coastal waters. During the period 1934-39 whale oil production from Antarctic whales fluctuated between 15 and 19 percent

1. Whaling carried out by boats that started from and returned to a port in the colonies.
2. Based on an average weight of 70 metric tons per whale.

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of the total weight of whales as landed, while coastal whales yielded not quite 7 percent of the total weight during 1931-35.

Whale oil is by far the most important product obtained from Antarctic whaling. In 1938 the value of Antarctic whale oil amounted to almost 20 million yen, or more than 90 percent of the total value of processed whale products. In 1936 whales caught in Antarctic waters yielded 26,000 metric tons of whale oil. This quantity represented 7 percent of Japan's total production of fats and oils. Annual production of oil from coastal whales averaged 3,410 metric tons in 1931-35. Antarctic whale oil was exported directly to European markets, mainly to Germany, where it was used for the production of oleomargarine.¹ However, these exports are not reported in the official statistics. Coastal whale oil was used for domestic consumption.

Whale meat played only a secondary role, but it did contribute some animal protein and fat to the Japanese diet.

V. TRADE, 1928-39

Although Japan was a net importer of fish in terms of physical quantities during the period 1930-34, it was a net exporter of fish in terms of value throughout the period 1928-39. (For data on the period 1928-36, see Table 9.)

Exports consisted largely of products of high value per ton, such as crab, salmon, and tuna, while imports were composed of medium- and low-

1. Nippon Suisan Nempo (Annual Report of Japan's Marine Industries), 1937.

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grade fish (largely dried and salted) for home consumption.

A. Imports

During 1928-36, imports of fish, in terms of fresh fish, ranged from 110,000 metric tons in 1936 to 390,000 metric tons in 1931.¹ Average annual imports for the three-year period 1928-30 amounted to 250,000 metric tons, increased to almost 350,000 metric tons during 1930-34,² and declined to 135,000 metric tons in 1935-36. The average annual value was 26.7 million yen, 31.6 million yen, and 17.4 million yen respectively.³ Imports consisted of fresh, frozen, dried, and salted fish and dried shellfish, chiefly from Korea. Imports from foreign countries, principally from the USSR (salted fish and fresh and frozen fish), Canada (salted fish), and the United States (frozen shrimp), contributed from one-sixth to one-fourth of the total value of imports. Imports from the Soviet Union, however, decreased sharply beginning in 1935. Canada and the United States ceased exporting fish to Japan only after the attack on Pearl Harbor.

B. Exports

Throughout the period 1928-36, Japan was a net exporter of fish in terms of value. In 1930, exports of fish accounted for about 2½ percent

1. Preserved fish converted to its fresh fish equivalent.
2. In addition, Japan imported annually from Korea during 1930-34 an average of almost 20,000 metric tons of fish oil (equivalent to about 220,000 metric tons in terms of fresh fish). These imports were, however, more than offset by exports of over 25,000 metric tons of fish oil (or about 300,000 metric tons in fresh fish equivalent). Since fish meal and cake are, for the most part, by-products of fish oil production, imports and exports of these commodities are included in the figures on fresh fish equivalent of fish oil.
3. For yen-dollar exchange rates, see Appendix, Table B.

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of the total value of Japanese exports. In 1928, 1929, 1935, and 1936, quantities exported also exceeded quantities imported. (See Table 9.) Exports consisted of fresh, frozen, dried, salted, and canned fish and shellfish. While dried and salted fish and shellfish and canned sardines went chiefly to Far Eastern countries, canned fish (mainly salmon and tuna) and shellfish (crab) and some frozen fish found markets in Western countries.

During the period 1928-30, average annual exports amounted to 230,000 metric tons in terms of fresh fish and were valued at 46.2 million yen. During the period 1930-34, average annual exports showed a slight increase in quantity as well as value. In the following period (1935-36), they rose to over 300,000 metric tons in fresh fish equivalent and the average annual value increased to about 72 million yen. (See Table 9.)

By 1936, the physical quantity of fish exports had increased to about 145 percent and the value to about 175 percent of the 1930 level. The greater increase in the value was due mainly to an increase in the proportion of high-value canned fish in exports and only to a minor extent to an increase in prices.

In 1936, exports of high-value canned fish played a larger role than they did in 1930. This trend was maintained through 1939, when exports of the four principal kinds of canned fish (crab, salmon, tuna, and sardines) amounted to over 83 million yen (Tables 10 and 11), as compared with 42 million yen for exports of the same species in 1934. Exports of canned crab and salmon averaged about 23 million yen (Table 10), or somewhat less than 50 percent of the total Japanese fish exports, during 1930-34, but increased to over 66 million yen, or about 65 percent of total fish exports, in 1939. Exports of canned tuna more than doubled,

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rising from 4 million yen in 1934 to 9 million yen in 1939 (Table 11). Exports of canned sardines, which amounted to 3.6 million yen in 1934, reached their peak in 1937, when exports were valued at over 11 million yen.

Canned salmon was exported mainly to European markets, principally the United Kingdom, France, and Belgium, whereas canned crab and tuna went mainly to the United States, with the United Kingdom ranking second as importer of Japanese crab. Sardines, however, were exported chiefly to Far Eastern countries, with the Philippine Islands and the Netherlands East Indies the leading markets.

VI. BALANCE OF THE TOTAL SUPPLY AND PER CAPITA CONSUMPTION OF FISH, 1928-36

The total supply of fish available for domestic consumption in Japan increased from 2.6 million metric tons annually during 1928-30 to almost 3.4 million metric tons annually in 1930-34 and somewhat over 3.5 million metric tons annually in 1935-36. (See Table 13.) Most of this supply was used for the production of fish oil and fertilizer; the balance was consumed as fish. Fish oil and fertilizer were made chiefly from herring, sardines, whales, shark, and the processing waste of fish canneries.

Average annual gross consumption¹ per capita in 1930-34 amounted to 51 kilograms.² (See Table 13.) This was an increase of about 10

1. Including non-food uses.
2. Fresh fish equivalent. This estimate does not take into consideration the trade in fish oil and meal. In 1930-34, net exports of fish oil amounted to 7,000 metric tons, or in fresh fish equivalent (including fish meal and cake for fertilizer) to about 80,000 metric tons or about 1 kilogram annually on a per capita basis. (See footnote 2, p.13.)

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kilograms over per capita consumption in the late 1920's. Since industrial uses (production of oil and fertilizer) and waste accounted for over half of this total, less than 50 percent remained for consumption as food. It is estimated that per capita food consumption of fish amounted to somewhat over 20 kilograms a year, or about 60 grams per day. This represented only about 3 percent of the caloric value of the average diet, but contributed from 12 to 14 grams of animal protein,¹ or over 80 percent of the total animal protein intake. Thus the place of fish in the diet in Japan is similar to that of meat and dairy products in Western countries. The importance of fish as a source of animal protein is illustrated in Table 14, where it is compared with other sources of this essential nutrient.

VII. PROSPECTS OF THE JAPANESE FISHING INDUSTRY
IN A NORMAL POSTWAR YEAR (1953)

The main problem of Japan's fishing industry is to increase production in order to meet domestic requirements of animal protein and contribute to the restoration of Japan's balance of payments by maximizing exports of canned fish, mainly crab and salmon.

In order to provide the Japanese population in 1953 with an average annual gross consumption of 51 kilograms of fish per capita (the 1930-34 level), a total supply of about 4.2 million metric tons would be required.² With present restrictions, however, it is esti-

1. Source for protein value of fish: Nutritional Laboratory of Japanese Ministry of Welfare, as reported in T. Saiki, Chemical Analysis of Food for Japan, 1941.
2. Based on an estimated population of 82.4 million in 1953. (See Appendix, Table A.)

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mated that the average annual catch cannot be raised above 2.7 million metric tons, with annual catches ranging from about 2.4 to 3.0 million metric tons.¹

Before the war, about 20 percent (approximately 600,000 metric tons) of the total fish production of Japan proper was caught outside the present fishing areas. The crab, salmon, and trout fisheries, which extended from Hokkaido northward to the Kurile Islands and the Kamchatka Peninsula, are most severely affected by the present restrictions on the Japanese fishing areas. These species are the ones that normally play the most important role, by value, in total Japanese exports of fish. Exports of crab meat in 1939, while less than 10 percent of the total quantity exported, accounted for over 30 million yen, or 29 percent of the total value of fish exports. Exports of canned salmon and trout in the same year were valued at 36 million yen, or over 35 percent of total exports of fish. Thus, in 1939 about 65 percent of the value of total fish exports was contributed by fisheries that operated almost entirely north of Japan proper. Since fish exports constituted over 2 percent of the total value of all Japanese exports, they provided the country with sizable amounts of foreign exchange.

If the Japanese should not operate their fisheries in the northern waters, they would be unable to produce canned salmon and crab for export. If there were to be no fishing or a reduction of fishing in Korean waters and southern waters, the Japanese catch of sardines and tuna respectively might be reduced somewhat.

1. Based on an estimate of the average prewar catch (excluding seaweed and whales) within the present fishing areas. The annual fish catch from March 1947 to March 1948 has been reported as 750 million kan, or 2.8 million metric tons. (Central News Despatch, Tokyo, April 16, 1948) It is believed that this figure includes seaweed and whales, however, and is therefore not quite comparable to the above-mentioned estimate.

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The adverse effect of the loss of fishing grounds on the postwar fish catch and thus on the consumption of animal protein in Japan can be seen by comparing per capita consumption of animal protein before the war — which was barely adequate — with present consumption. Table 15 shows that the average intake of animal protein has decreased by 44 percent from the prewar level and consumption of protein from fish has decreased by 45 percent. It is estimated that in 1953 the per capita consumption level will be even lower, because the increase in population will not have been offset by the small increase in production.

A solution of the problems that face Japan in regard to its production, trade, and consumption of fish depends on (1) expanding fishing areas, (2) reducing the amount of fish used for non-food purposes, and (3) finding markets for fish products.

Since fish and fish products are the principal source of animal protein in the Japanese diet, an annual catch of 2.7 million metric tons of fish, or even the prewar average catch of 3.3 million metric tons, would not be sufficient to supply the daily prewar per capita intake of about 14 grams of animal protein. To meet requirements of over 4 million metric tons, means will have to be found to increase the average annual catch by 1.0-1.5 million metric tons.

One way to increase the domestic fish supply is to reduce the amount of fish used for non-food purposes, such as fertilizer and animal feed. Since the fish used for such purposes is largely the by-product of fish oil production, it cannot be expected that all fish would then be available for use as food. If, however, 40 percent of the fish used for industrial purposes before the war could in future years be used for direct

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human consumption, an additional 600,000 metric tons of fish would become available as food. A satisfactory solution of this problem will depend largely on the availability of additional preserving facilities, including refrigeration. It should be noted that the loss for industrial uses would, however, have to be made up from other sources.

While a reduction of 40 percent in the amount of fish used for non-food purposes would help to meet increased requirements caused by the increase in population, about 1 million additional metric tons of fish¹ would still be required to supply a daily per capita intake of about 14 grams of animal protein. It appears, therefore, that a solution of the problem of raising the present low level of animal protein consumption depends chiefly on the possibility of raising the fish catch through expansion of coastal and offshore fishing.

If such expansion of fishing areas could be effected, the Japanese fishing industry could contribute to the restoration of Japan's balance of payments by maximizing exports of canned fish. In order to do so, however, it will have to find markets for its fish products. There was a sizable market for canned sardines in the Philippine Islands and the Netherlands East Indies before the war, but so far these countries have not reverted to Japan for their fish supply. Japan at present has canned sardines ready to be shipped for which no markets have as yet been found. Currency arrangements that would allow these former markets to purchase freely would contribute importantly to the solution of this problem.

1. Assuming an annual catch of 2.7 million metric tons and a population of 82.4 million in 1953.

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Were the Japanese to resume fishing north of Japan and in the Okhotsk and Bering Seas and thus to produce canned salmon and crab, the Western markets for these products could probably be easily recovered. There would appear to be a good market for high-quality tuna in the United States. It appears, therefore, that a solution of the problem of maximizing exports, as well as satisfying Japan's minimum requirements of animal protein, depends chiefly on the possibility of raising the fish catch through expansion of coastal and off-shore fishing.

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Table 1. JAPAN'S CONTRIBUTION TO THE WORLD FISH CATCH, 1935 and 1936

FISH PRODUCTION STATISTICS OF MAJOR FISHING NATIONS

(In 1,000 metric tons)

	1935	1936
Japan proper	3,554 ^a	3,872 ^a
Korea	1,427 ^b	1,518 ^b
Karafuto	331 ^c	329 ^c
Japanese Empire	5,312	5,719
United States	1,883 ^d	2,196 ^d
USSR	1,550 ^e	1,620 ^e
China	f	1,271 ^f
Norway	1,037 ^h	1,147 ^h
Great Britain	1,013 ^h	1,064 ^h
Germany	469 ^h	569 ^h
Canada	433 ⁱ	504 ⁱ
Iceland	266 ^h	261 ^h
France	264 ^h	275 ^h
Estimated world catch	16,800 ^j	16,800 ^j

- a. Sources: Nippon Suisan Nempo (Annual Report of Japan's Marine Industries), 1941; Statistical Abstract of the Ministry of Agriculture and Forestry, 1935-36 and 1936-39. These figures do not include seaweed. The Japanese generally include production of seaweed in their data on total production, a fact that has been a source of frequent confusion and overestimation of fish production, particularly with regard to estimates of present and future production. In 1935 and 1936, fish catches in Japan were higher than the average annual catch for the 1930's; for comparison, see Tables 2, 3, and 13.
- b. Source: Chosen Sotokufu Tokei Nempo (Statistical Yearbook of the Government General of Korea), 1937 and 1938.
- c. Source: Karafuto Cho Tokei Sho (Statistical Returns of the Government of Karafuto), 1936; Kokusei Gurafu (Statistical Review of Japan), 1944.
- d. Source: Statistical Abstract of the United States, 1937 and 1938.
- e. Source: US Department of the Interior, Wildlife and Fisheries Service. About $\frac{1}{4}$ of the total Soviet production is caught in Far Eastern Waters.
- f. Statistics not available.
- g. Source: Orient Yearbook, 1942.
- h. Source: Das Statistische Jahrbuch für das Deutsche Reich, Berlin, 1941-42.
- i. Source: US Department of the Interior, Wildlife and Fisheries Service. About 45 percent of the Canadian production is caught in the Pacific Ocean.
- j. Source: US Department of the Interior, Wildlife and Fisheries Service. This estimate includes countries not mentioned here.

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Table 2. THE FISH CATCH OF THE JAPANESE EMPIRE
ANNUAL AVERAGES FOR THE PERIODS 1928-30, 1930-34, 1935-36, and 1937-39
(In 1,000 metric tons)

Annual Averages	JAPAN PROPER				PRINCIPAL COLONIES ^a			GRAND TOTAL FOR JAPANESE EMPIRE
	Coastal Fishing	Aquaculture ^b	Offshore Fishing	Overseas Fishing ^c	Total for Japan Proper ^d	Korea	Karafuto	Total for Principal Colonies
1928-30	1,772	63	538	248	2,621	796	533	3,950
1930-34	2,336	75	643	215	3,269	1,015	468	4,752
1935-36	2,362	123	895	333	3,713	1,472	330	5,515
1937-39	2,059	124	812	371	3,366	1,929	254	5,549

- a. Catch landed by boats that started from and returned to a port in Korea or Karafuto. The fish catch in other colonies was relatively small: in Formosa, average annual production amounted to 32,000 metric tons during the period 1935-38; in the Kwantung Peninsula, to 40,000 metric tons (including seaweed) annually in 1930-34; and in the Mandated Islands, to about 4,000 metric tons during 1930-34. These areas are not included in the total.
- b. Aquaculture refers to the culture of oyster, clam, mullet, carp, and eel.
- c. Overseas fishing includes the fish catch from Japanese operations carried on in waters off Korea, Formosa, the Kwantung Peninsula, and the Kurile Islands, in Russian and Manchu waters, and from trawlers and floating canneries.
- d. These figures do not include seaweed. The Japanese generally include production of seaweed in their data on total production, a fact that has been a source of frequent confusion and overestimation of fish production, particularly with regard to estimates of present and future production. In Japan proper, average annual production of seaweed in 1930-34 amounted to about 550,000 metric tons. For more data on fish production in Japan, see SCAP, Natural Resources Section, Japanese Fisheries Production, 1908-46, October 1947. In the SCAP report seaweed and whales are included in the data on total fish catch, while in the present study seaweed is excluded and figures on whaling are given separately. This study was prepared independently; slight discrepancies between the data given in this study and the statistics on production in the SCAP report are due mainly to the use of different conversion factors. The methods of converting certain species of fish from volume units or numbers of fish into weight units are explained in the SCAP report as well as in this study.

Sources: Morinsho Tokaihyo, Showa 14th Year (Agricultural Statistics, 1939), published by the Ministry of Agriculture and Forestry, Tokyo; Chosen Sotokufu Tokai Nempo (Statistical Yearbook of the Government General of Korea), 1930-39; Kowsei Gurafu (Statistical Review) 1944; Karafuto Cho Tokai Sho (Statistical Returns of the Government of Karafuto), 1930-39; Nippon Suisan Nempo (Annual Report of Japan's Marine Industries), 1941.

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Table 3. JAPAN PROPER: FISH CATCH BY AREAS
ANNUAL AVERAGES FOR 1928-30, 1930-34, AND 1935-36

(In 1,000 metric tons)

Areas	Annual Averages			
	1928-30	1930-34	1935-36	1937-39
Coastal Fishing	1,772.1	2,336.7	2,361.8	2,058.9
Fish ^a	1,499.1	2,028.8	2,036.3	1,761.5
Crustaceans and molluscs ^b	137.7	170.3	147.1	173.7
Other shellfish ^c	135.3	136.6	178.4	123.7
Aquiculture	63.0	75.2	123.0	124.1
Fish ^d	12.3	15.9	20.3	20.2
Shellfish ^e	50.7	59.3	102.7	103.9
Offshore Fishing ^f	537.7	642.8	894.7	811.5
Fish	537.7	642.8	894.7	811.5
Overseas Fishing	247.7	215.7	333.6	371.5
Fish	226.1	202.5	318.8	351.3
Korean waters	75.5	61.9	78.8	25.9
Formosan waters	1.0	0.9	0.1	0.8
Kwantung waters	3.1	3.1	6.8	4.6
Manchu waters	0.0	0.0	2.0	3.4
Kurile waters	5	5	80.4	178.8
Russian waters ^h	86.0	73.5	80.5	77.3
Trawling	61.0	56.0	52.8	41.5
Floating canneries ⁱ	5	7.1	18.3	19.0
Crabs ^j	21.1	13.2	13.8	20.2
Kurile waters	5	5	1.3	2.6
Russian waters	4.7	2.6	4.2	6.1
Floating canneries	16.4	10.6	8.3	11.5
TOTAL FISH AND SHELLFISH	2,620.5	3,269.4	3,713.1	3,366.0

- a. Including herring, sardine, bonito, mackerel, tuna, yellow-tail, ood, and pollack, shark, red sea-bream, flat-fish (flounder), cybium (Spanish mackerel), horse-mackerel, flying-fish, grey-mullet, komotrus, dog-salmon, trout, Japanese smelt eel, and others.
- b. Including cuttlefish, octopus, prawn, shrimp, spiny lobster, crab, beche-de-mer, and others.
- c. Including abalone, oyster, clam, turbo (topshell), arca (arkshell), tapes, and others.
- d. Including carp, eel, and mullet.
- e. Including oyster and clam.
- f. Including sardine, bonito, mackerel, tuna, ood, shark, sea-bream, flat-fish (flounder), cybium (Spanish mackerel), skipper (saury mackerel), and others.
- g. Statistics not available.
- h. Salmon and trout.
- i. Salmon. Official statistics are reported in numbers of salmon. The Japan Trade Guide gives the 1936 floating canneries catch as 9,000,000 salmon or 16,000 tons, figures that indicate a weight of 1.8 kg. per salmon. Data given above are calculated on this basis.
- j. The conversion factor of 0.725 kg. per crab was used where official statistics were in terms of numbers of crabs. During 1931-36 statistics were also given in number of cases of canned crab. One case contains 22.32 kg. net. Assuming that this represents the edible portion only, or 48 percent (refuse for crabs generally amounts to 52 percent), the weight of total crab used for 1 case would amount to 46.5 kg. and the weight of 1 crab would equal 0.725 kg. (weighted average of the 6 years from 1931-36).

Sources: Morinsho Tokaihyo, Showa 14th Year (Agricultural Statistics, 1939); Nippon Suisan Nempo (Annual Report of Japan's Marine Industries), 1941.

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Table 4. JAPAN PROPER: PRODUCTION OF HERRING AND SARDINES COMPARED WITH TOTAL FISH CATCH, 1928-39

Year	Production of Herring and Sardines (- - - - -In 1,000 metric tons- - - - -)	Total Fish Catch	Herring and Sardines as Percent of Total Fish Catch (%)
1928	1,089	2,577	42
1929	1,074	2,653	40
1930	1,116	2,630	42
1931	1,431	2,939	49
1932	1,573	2,908	54
1933	2,532	4,189	60
1934	1,850	3,681	50
1935	1,607	3,554	45
1936	1,771	3,872	46
1937	1,324	3,496	38
1938	1,128	3,226	35
1939	1,214	3,376	36

Sources: Norinsho Tokeshiyo, Showa 14th Year (Agricultural Statistics, 1939), and Statistical Abstract of the Ministry of Agriculture and Forestry, 1936-37.

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Table 5. JAPAN PROPER: PRODUCTION OF HERRING AND SARDINES FROM COASTAL AND OFFSHORE FISHERIES, 1928-39

(In 1,000 metric tons)				
Year	Herring Coastal Catch	Sardines Coastal Catch	Sardines Offshore Catch	Sardines Total Catch
1928	412.8	579.4	96.7	678.1
1929	307.3	676.9	90.1	767.0
1930	327.6	715.0	73.7	788.7
1931	405.2	911.8	113.7	1,025.5
1932	419.7	993.9	159.5	1,153.4
1933	1,007.6	1,314.8	210.2	1,525.0
1934	383.2	1,278.1	189.0	1,467.1
1935	229.4	1,095.8	281.9	1,377.7
1936	143.0	1,302.3	326.0	1,628.3
1937	116.1	1,005.6	202.3	1,207.9
1938	43.4	938.6	145.8	1,084.4
1939	122.6	868.5	222.6	1,091.1

Sources: Nippon Suisan Nempo (Annual Report of Japan's Marine Industries), 1941, and Statistical Abstract of the Ministry of Agriculture and Forestry, 1936-37.

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Table 6. JAPAN PROPER: PRODUCTION OF TUNA FROM COASTAL AND OFFSHORE FISHERIES, 1928-39

(In 1,000 metric tons)

Year	Coastal Catch	Offshore Catch	Total Catch
1928	15.1	28.7	43.8
1929	17.8	42.6	60.2
1930	20.8	42.3	63.1
1931	19.4	45.8	65.2
1932	20.0	40.0	60.0
1933	21.5	41.7	63.2
1934	22.1	36.0	58.1
1935	34.3	34.2	68.5
1936	33.8	42.2	76.0
1937	25.2	37.0	62.2
1938	17.4	40.0	57.4
1939	34.6	51.3	85.9

Sources: Nippon Suisan Nempo (Annual Report of Japan's Marine Industries), 1941, and Statistical Abstract of the Ministry of Agriculture and Forestry, 1936-37.

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Table 7. JAPAN PROPER: PRODUCTION OF SALMON AND TROUT FROM COASTAL AND OVERSEAS FISHERIES, 1928-39

(In 1,000 metric tons except where otherwise specified)

Year	Coastal Catch		Overseas Catch				Total		Overseas Catch as Percentage of Total Catch
	Salmon	Trout	Total Coastal Catch	Russian Waters	Floating Canneries	Kurile Waters	Total Overseas Catch	Total Coastal and Overseas Catch	
1928	7.5	12.4	19.9	112.7	a	a	112.7	132.6	85
1929	12.3	36.7	49.0	56.5	a	a	56.5	105.3	53
1930	16.7	17.9	34.6	89.0	1.2	a	90.2	124.8	72
1931	17.5	41.2	58.7	45.8	2.1	a	47.9	106.6	45
1932	10.5	12.9	23.4	76.8	5.9	a	82.7	106.1	78
1933	18.5	20.8	39.3	47.7	10.1	a	57.8	97.1	60
1934	26.4	36.2	62.6	108.2	16.1	a	124.3	186.9	67
1935	29.7	44.4	74.1	75.3	20.8	67.0	163.1	237.2	69
1936	66.4	58.6	125.0	85.7	15.8	93.0	194.5	319.5	61
1937	64.6	111.4	176.0	82.5	18.2	152.0	252.7	428.7	59
1938	72.8	76.5	149.3	72.0	17.7	149.0	238.7	388.0	62
1939	50.2	104.1	154.3	76.5	21.0	236.0	333.5	487.8	68

a. Statistics not available.

Sources: Nippon Suisan Nempo (Annual Report of Japan's Marine Industries), 1941, and Statistical Abstract of the Ministry of Agriculture and Forestry, 1936-37.

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Table 8. JAPAN PROPER: PRODUCTION OF CRAB FROM COASTAL AND OVERSEAS FISHERIES, 1928-39
(In '000 metric tons except where otherwise specified)

Year	Coastal Catch	Overseas Catch		Total	Crab Catch (Coastal & Overseas) as Percentage of Total Catch
		Floating Canaries	Russian Meters		
1928	6.2	14.1	5.7	19.8	25.0
1929	4.4	16.1	4.9	21.0	25.4
1930	7.8	18.8	3.4	22.2	30.0
1931	8.5	11.2	3.1	14.3	22.8
1932	8.5	8.1	2.2	10.3	18.8
1933	16.6	7.1	1.8	8.9	25.5
1934	18.8	7.5	2.6	10.1	28.9
1935	20.7	8.0	3.7	12.7	33.4
1936	16.2	8.6	4.8	15.1	31.3
1937	19.9	10.8	5.6	18.6	38.5
1938	21.7	13.4	6.1	22.1	46.8
1939	27.2	10.3	6.5	19.9	47.1

a. Statistics not available.

Sources: Nippon Suisan Nempo (Annual Report of Japan's Marine Industries), 1941, and Statistics Abstract of the Ministry of Agriculture and Forestry, 1936-37.

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Table 9. JAPAN PROPER: IMPORTS AND EXPORTS OF FISH, 1928-39
(Quantities in '000 metric tons; values in '000,000 yen)

Year	Quantity ^a		Value ^b	
	Imports	Exports	Imports	Exports
1928	0.1	0.1	15.3	24.1
1929	0.1	0.1	15.3	24.1
1930	0.1	0.1	15.3	24.1
1931	0.1	0.1	15.3	24.1
1932	0.1	0.1	15.3	24.1
1933	0.1	0.1	15.3	24.1
1934	0.1	0.1	15.3	24.1
1935	0.1	0.1	15.3	24.1
1936	0.1	0.1	15.3	24.1
1937	0.1	0.1	15.3	24.1
1938	0.1	0.1	15.3	24.1
1939	0.1	0.1	15.3	24.1

In order to obtain a basis for comparison, preserved fish was converted to its fresh fish equivalent. Average prices for species not included in the table were based on reported value and the annual average price for species included in the table. Imports of fish and shellfish. Imports came from foreign countries and the colonies, chiefly Korea. Imports of fish oil and meal are not included. Exports of fish and shellfish. Exports consisted of fresh, frozen, dried, salted, and canned fish and shellfish. Canned fish and shellfish were shipped to foreign countries only, while dried fish and salted fish were exported to the colonies. Exports of fish oil and meal are not included. (See footnote 2, p. 13.)

d. Minus sign indicates net imports. Note that the value of exports exceeded the value of imports.

e. For yen-dollar exchange rates, see Appendix, Table B.

Sources: Annual Return of the Foreign Trade of Japan, 1932, 1934, and 1936, published by the Ministry of Finance; Tokyo Chosen Boku Nempo (Annual Trade Returns of Korea, 1928-39), published by the Ministry of Finance; Tokyo Chosen Boku Nempo (Annual Trade Returns of Korea, 1928-39), published by the Ministry of Finance.

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Table 10. JAPAN PROPER : EXPORTS OF CANNED CRAB, SALMON AND TROUT, 1928-40

(Quantities in metric tons; values in 1,000,000 yen)

Year	Canned Crab ^b		Canned Salmon and Trout ^c		Total Value ^d
	Quantity	Value	Quantity	Value	
1928	14,390	18.57	2,459	1.10	19.67
1929	11,496	16.71	10,788	4.39	21.10
Av. 1928-30	12,273	16.59	7,715	3.16	19.75
1930	10,933	14.48	9,899	3.98	18.46
1931	10,022	12.16	10,966	3.70	15.86
1932	8,858	10.75	12,520	5.04	15.79
1933	11,841	18.62	19,431	11.23	29.85
1934	9,588	15.42	22,589	18.86	34.28
Av. 1930-34	10,248	14.29	15,081	8.56	22.85
1935	12,186	19.66	24,453	16.19	35.85
1936	10,283	17.20	32,105	26.94	44.14
Av. 1935-36	11,234	18.43	28,279	21.56	39.99
1937	11,131	19.87	37,574	27.49	47.36
1938	8,671	15.24	51,307	38.46	53.70
1939	17,471	30.32	41,043	36.00	66.32
Av. 1937-39	12,424	21.81	43,308	33.98	55.79
1940	4,810	8.53	8,783	6.69	15.22

- a. Weight of canned products. For approximate fresh fish equivalent, apply the conversion factor 2.
b. Excluding exports of the nine Japanese land canneries in Kamchatka. Crab canned in the Kamchatka land canneries was exported directly to European countries and is not reported in export statistics.
c. Excluding salmon and trout canned by Japanese land canneries in Kamchatka and exported to European countries.
d. For yen-dollar exchange rates, see Appendix, Table B.

Source: Annual Returns of the Foreign Trade of Japan, 1929, 1930, 1932, 1934, 1936, 1938, and 1940. The quantities were in terms of 100 kin; 100 kin = 0.06 metric tons.

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Table 11. JAPAN PROPER: EXPORTS OF CANNED TUNA AND SARDINES, 1934-40^a

(Quantities in metric tons; values in 1,000,000 yen)

Year	Canned Tuna		Canned Sardines ^b	
	Quantity	Value ^c	Quantity	Value ^c
1934	4,171	3.85	13,671	3.91
1935	5,344	4.99	21,822	5.57
1936	4,885	4.65	29,959	7.48
Av. 1935-36	5,114	4.82	25,890	6.52
1937	8,014	7.79	42,008	11.18
1938	4,497	4.07	25,502	7.54
1939	8,498	8.86	24,253	7.94
Av. 1937-39	7,002	6.91	30,588	8.89
1940	4,798	7.20	12,853	6.31

- a. Through 1933, statistics on exports of canned tuna and sardines were included in "other fish in tins."
b. Includes "sardines in tomatoes," "sardines in oil," and "others."
c. For yen-dollar exchange rates, see Appendix, Table B.

Source: Annual Returns of the Foreign Trade of Japan, 1929, 1930, 1932, 1934, 1936, 1938, and 1940.

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Table 12. JAPANESE WHALE CATCH, ANNUAL AVERAGES 1928-30, 1930-34, 1935-36, and 1937-39

Annual Averages ^a	Coastal Whaling ^b	Colonial Whaling ^{b,c}	Antarctic Whaling ^d	Value of Processed Products ^e
	(- - - in 1,000 metric tons - - -)			(in 1,000 yen)
1928-30	49	12	f	2,009
1930-34	48	9	15 ^g	2,126
1935-36	65	7	91	8,718
1937-39	77	8	469 ^h	24,300

- a. Fiscal years beginning April 1. Average catch of Antarctic whaling seasons from November of years recorded to March of the following year.
- b. Approximate weight of whales as landed, based on an average weight of 40 metric tons per whale. (During 1931-35, the amount of whale oil produced from coastal whales averaged about 7 percent of the total weight of whales as landed.)
- c. Whaling carried out by boats that started from and returned to a port in the colonies.
- d. Approximate weight of whales as landed, based on an average weight of 70 metric tons per whale. (The amount of whale oil produced from Antarctic whales varied between 15 and 19 percent of the total weight of whales as landed.)
- e. Excluding whaling production of colonies.
- f. There was no Japanese Antarctic whaling before 1934.
- g. 1934 only. See footnote f, above.
- h. In 1940 a record catch of about 700,000 metric tons was made.

Source: Nippon Suisan Nempo (Annual Report of Japan's Marine Industries), 1941. This source gives the catch in numbers of whales only. For conversion to metric tons, see footnotes b and d above.

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Table 13. JAPAN PROPER: BALANCE OF THE TOTAL SUPPLY AND GROSS PER CAPITA CONSUMPTION OF FISH, 1928-36

Year	Production (- - - - - in 1,000 metric tons - - - - -)	Net Imports (+) or Exports (-)	Net Supply (- - - - -)	Apparent per Capita Consumption ^a (in kgs)
1928	2,577	-40	2,537	40.5
1929	2,653	-40	2,613	41.1
Av. 1928-30	2,620	+20	2,640	41.6
1930	2,630	+140	2,770	43.0
1931	2,939	+190	3,129	47.9
1932	2,908	+160	3,068	46.3
1933	4,189	+20	4,209	62.6
1934	3,681	+50	3,731	54.6
Av. 1930-34	3,269	+112	3,381	51.0
1935	3,554	-120	3,434	49.5
1936	3,872	-220	3,652	51.9
Av. 1935-36	3,713	-170	3,543	50.7

a. Gross consumption, i.e., before deductions were made for non-food uses (distribution waste and industrial uses). Population figures derived from official Japanese census statistics for 1930 and 1935 were used in calculating the per capita consumption. (See Appendix, Table A.) (See footnote 2, p.15.)

Sources: Nippon Suisan Nempo (Annual Report of Japan's Marine Industries), 1941; Statistical Abstract of the Ministry of Agriculture and Forestry, 1935-36 and 1936-37, Tokyo; Annual Returns of the Foreign Trade of Japan, 1929, 1930, 1932, 1934, and 1936; Chosen Boeki Nempo (Annual Trade Returns of Korea), 1928-36; Taiwan Boeki Nempo (Annual Trade Returns of Formosa), 1929, 1932, 1933, and 1936.

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Table 14. JAPAN'S DAILY PREWAR PER CAPITA CONSUMPTION OF ANIMAL PROTEIN^a

Food Source	Quantity (in grams)	Percentage of total
Fish	13.8	84.2
Whale meat	b	- -
Meat ^c	1.2	7.3
Eggs	0.9	5.5
Milk and dairy products	0.5	3.0
Total animal proteins	16.4	100.0

- a. Based on data for the period 1930-39. Population figures derived from official Japanese census statistics for 1930 and 1935 were used in calculating the per capita consumption. (For data on population, see Appendix, Table A.)
- b. Statistics not available.
- c. Including beef, pork, mutton, goat meat, and poultry.

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Table 15. COMPARISON OF JAPAN'S DAILY PREWAR PER CAPITA CONSUMPTION OF ANIMAL PROTEIN WITH PRESENT CONSUMPTION

Total Animal Protein ^b From:	Prewar Consumption	Present Consumption ^a	Present Animal Protein Consumption as Percentage of Prewar Consumption (%)
	(----- in grams -----)		
Fish	16.4	9.23	56
Whale meat	13.8	7.60	55
Meat	0	0.23	
Eggs	1.2	0.74	62
Milk and dairy products	0.9	0.38	42
	0.5	0.28	56

- a. Based on data for 1947, estimating the total fish catch at 2.6 million metric tons.
- b. Consumption of vegetable proteins amounted to about 50 grams before the war and somewhat over 40 grams in 1947, or a decline of 18 percent. In contrast, consumption of animal protein declined 44 percent.
- c. Statistics not available.
- d. Including beef, pork, mutton, goat meat, and poultry.

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APPENDIX

STATISTICS ON POPULATION AND FOREIGN EXCHANGE

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- 37 -

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Table A. ESTIMATED POPULATION OF JAPAN PROPER, 1928-40 AND 1953
(in millions)

<u>Year</u>	<u>Population</u>
1928	62.70
1929	63.60
1930	64.45
1931	65.37
1932	66.31
1933	67.29
1934	68.29
1935 ^a	69.40
1936	70.31
1937	70.98
1938	71.67
1939	72.34
1940 ^a	73.11
Av. 1928-30	63.58
Av. 1930-34	66.34
Av. 1935-36	69.85
Av. 1937-39	71.66
1953	82.40

a. Official Japanese census data. All other years estimated.

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- 38 -
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Table B. YEN-DOLLAR EXCHANGE RATES, 1928-40

Year	US \$ per 100 Yen
1928	46.457
1929	46.070
1930	49.367
1931	48.871
1932	28.120
1933	25.227
1934	29.511
1935	28.570
1936	28.951
1937	28.813
1938	28.496
1939	25.963
1940	23.436

Sources: Bank of Japan, Economic Statistics of Japan, 1937; Ministry of Finance, Financial and Economic Annual of Japan, 1941.

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